

RETHINKING THREAT CHARACTERIZATION IN AN ADVANCING  
BIOTECHNOLOGY ERA: A MORAL PERSPECTIVE

By  
Claire Elise Mena

A thesis submitted to Johns Hopkins University in conformity with the requirements for the  
degree of Master of Bioethics

Baltimore, Maryland  
2018

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## **Abstract**

In May 2017, the unveiling of the President's Fiscal Year (FY) 2018 budget revealed a significant change in the Department of Homeland Security's (DHS) allocation; funding would cease for certain laboratories, including the National Biological Analysis and Countermeasures Center (NBACC). In a time when advances in biotechnology and concerns of biosecurity are increasing, lawmakers and security experts feared closing of the laboratory could exacerbate biological threat vulnerabilities. While funding was restored with the passage of the Federal Omnibus Spending Bill, prospect of defunding serves as an important moment to consider whether a program, once controversial at its outset, should continue in the future. This paper outlines the legal and ethical justifications of threat characterization and discusses the challenges of ending a program we have grown to accept and rely on. Ultimately, whether or not threat characterization is to continue on in the future, policy makers should consider whether the potential benefits of the program are proportional to the foreseeable consequences.

Primary reader: Dr. Gail Geller  
Secondary Reader: Dr. Debra Mathews

## **Acknowledgements**

I would like to thank my thesis advisors Dr. Geller and Dr. Mathews, as well as Dr. Rieder and Dr. Gronvall, for their continual support, encouragement, and input throughout this project. Additionally, I would like to thank my MBE classmates who assisted me throughout this process; their debate and discussion provided an unparalleled experience for me as I formed the groundwork for this project.

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In May 2017, the unveiling of the President's Fiscal Year (FY) 2018 budget revealed a significant change in the Department of Homeland Security's (DHS) allocation; funding would cease for certain laboratories, including the National Biological Analysis and Countermeasures Center (NBACC). The biological laboratory in Fort Detrick, Maryland was initially created under DHS in response to the 2001 Amerithrax letter attacks and continues to strive to protect and prepare for biological threats. In a time when advances in biotechnology and concerns of biosecurity are increasing, lawmakers and security experts questioned the judgment behind the funding change. While funding was restored with the passage on March 23, 2018 of the Federal Omnibus Spending Bill, prospect of defunding provided an important opportunity – more than a decade after its establishment – to examine the true costs of closure and the merits of continuation of the NBACC.

## **The background of threat assessment**

In 1969, in a historic announcement, President Nixon denounced the use of biological weapons and proclaimed the closure of the United States' biological warfare program (Tucker, 2004). Henry Kissinger, former Secretary of State and National Security Advisor under President Nixon, and later Gerald Ford, subsequently issued the National Security Decision Memorandum 35 (NSDM-35) to implement Nixon's decision. The memorandum called for the ban of all biological warfare agents and for the extermination of any stockpiles, but allowed for the continuing of research in areas of biodefense for countermeasures such as vaccines and drugs (Kissinger, 1969). Further, research conducted to better understand "offensive aspects of bacteriological/biological agents" to better guide defensive priorities was permitted to continue

as well. The scope of this research was not clearly defined and was subject to interpretation (Tucker, 2004).

The United States' decision to end the biological weapons program spurred international condemnation of the use of biological weapons. In 1972, major nation states convened for the first Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on their Destruction, or more commonly referred to as the Biological Weapons Convention (BWC) (BWC, 1972). The resulting BWC Treaty renounced state programs with the means to “develop, produce, stockpile or otherwise acquire or retain microbial or other biological agents, or toxins” that are not used for “prophylactic, protective or other peaceful purposes” as well as “weapons, equipment or means of delivery” utilized for agents or toxins for nefarious purposes (BWC Treaty). At the time, many nation states may have believed that biological weapons were of little use compared to other forms of warfare and so joining as a signatory may not have posed a major burden. While the treaty lacked enforcement mechanisms (described below), it most likely created a greater obstacle for countries to openly and easily conduct a biological weapons program (Enemark, 2016).

While the treaty may have made it politically more difficult to openly conduct a biological weapons program, the Soviet Union successfully created “Biopreparat” under the guise of a government pharmaceutical facility for creating vaccines for civilians only a year after signing on to the treaty. In reality, it was a massive biological weapons program, employing an estimated 50,000 employees across 52 sites (Davis, 1999; Alibek, 1999).

The BWC Treaty did little to assure the Soviet Union that the United States would actually put an end to their biological weapons program; rather, the Soviet Union believed it to

be an effort to switch from an overt biological weapons program to a covert one. In his memoir Biohazard, Soviet defector Ken Alibek wrote, “We didn't believe a word of Nixon’s announcement. Even though the massive United States biological munitions stockpile was ordered to be destroyed, and some twenty-two hundred researchers and technicians lost their jobs, we thought the Americans were only wrapping a thicker cloak around their activities” (Alibek, 1999). Biopreparat was not discovered until after the fall of the Soviet Union (Enemark, 2016).

Following the signing of the BWC Treaty, National Security Advisor Brent Scowcroft, successor to Henry Kissinger, issued a second memorandum in 1974 (Tucker, 2004). The memo outlined policy guidelines to implement the BWC Treaty within the United States and outlined which activities were permitted for peaceful or protective purposes (Tucker, 2006). The scope of activities included those “concerned with the protection of human beings, animals, plants, and material from the effects of exposure to microbial or other biological agents or toxins, including vulnerability studies and research, development and testing of equipment and devices such as protective masks and clothing, air and water filtration systems, detection, warning and identification devices, and decontamination systems” (CBW, 2002). While vulnerability studies were permitted within defensive measures according to the memorandum, it did not include certain threat assessment areas of research including the creation of novel pathogens or weaponization activities (Tucker, 2004).

Following the memorandum, the United States continued to pursue biological defensive research in an unclassified and open manner, but the approach to biodefense began to take a turn in the late 1990s (Tucker, 2004). The discovery of the Soviet Union’s and Iraq’s biological weapon’s program, as well as Aum Shinrikyo’s attempted use of biological weapons, raised

concerns of both state and non-state actors' desires to pursue biological warfare (Enemark, 2016). In response to these concerns, the Pentagon and Intelligence community began conducting threat assessment activities without informing Congress (Tucker, 2004). For a period of time, even the National Security Council Staff under the Clinton Administration were not fully aware of the efforts underway (Tucker, 2004).

In September 2001, the New York Times revealed secret biological weapons projects conducted in the United States: Project Clear Vision, Project Bacchus, and Project Jefferson (Miller, Engelberg, & Broad, 2001). Project Jefferson focused on re-creating the genetically modified strain of *Bacillus anthracis* (anthrax) bacteria developed by Russian scientists in the early 1990s (Tucker, 2004; Enemark, 2016). This research was used to determine whether the strain would be resistant to the United States' current anthrax vaccine. The second project, Project Clear Vision, raised the greatest concerns around treaty compliance (Tucker, 2004). The project worked to re-create and test a biological agent bomblet (a device used to disperse a simulant pathogen) formerly created by the Soviet Union. The research was conducted by filling bomblets with simulant pathogens to better understand the dissemination characteristics and the effects of atmospheric conditions (Enemark, 2016). The third project, Project Bacchus, simulated the production of mass-producing anthrax through constructing a mock biowarfare facility with off the shelf equipment (Tucker, 2004).

The Bush Administration stated that the three projects were created for defensive intentions and were therefore BWC Treaty compliant (Tucker, 2004). While certain projects appeared to have defensive intentions, and were compliant with the treaty, many legal experts believed that certain work, including the work conducted under Project Clear Vision, clearly crossed the line of the BWC Treaty (Tucker, 2004).



The projects were exposed merely months after the United States announced it would not support a multilateral protocol to verify BWC Treaty compliance among state-parties (Enemark, 2016, Miller et al., 2001). The legal measures were proposed to strengthen the treaties regulatory power through mandatory declarations and inspections (Tucker, 2004). The Bush Administration feared the facilities site visits would compromise classified biodefense work (Tucker, 2004). Further, the secret projects were omitted in the United States' submission of its annual confidence building measure (CBM) declarations for the treaty (Tucker, 2004). CBMs were used as a mechanism to ensure treaty compliance by declaring the country's biodefense projects (Tucker, 2004). The revelation of secret projects, coupled with the United States' unwillingness to participate in compliance measures, generated suspicion surrounding the country's true intentions (Enemark, 2016).

The controversy of the secret projects was quickly superseded by the events of 9/11 only a week later and the subsequent Amerithrax letter attacks (Enemark, 2016). After the two attacks, the fears of a mass biological attack by a hostile state or terrorist group surged. A planned biological attack could pose unique threats as compared to other forms of warfare; it could appear to be a naturally occurring disease which would make it more difficult to recognize an attack and discover the perpetrator (The White House, 2004). Further, many feared the dual use nature of research (the ability to be used for beneficent or nefarious purposes (World Health Organization, 2015) made it difficult to gather intelligence and determine potential threats. With the advances in biotechnology and life sciences such as the creation of modified and novel agents during this period, officials worried that the capabilities of a potential attacker would only increase as technology and knowledge improved (The White House, 2004).

## **The creation of the NBACC**

These increasing fears led to Homeland Security Presidential Directive 10 (HSPD-10), (Biodefense for the 21<sup>st</sup> Century) which was signed by President Bush on April 21, 2002 (Bush, 2004). In the directive, the Bush Administration made clear that the effects of an attack could 1) cause catastrophic damage leading to long term disease, disability, psychological trauma, as well as mass panic; 2) disrupt sectors of the economy and the everyday lives of Americans; and 3) lead to international problems through the disruption of trade relationships (Bush, 2004). After a 10-month review of the nation's biodefense capabilities, the directive served as a framework to guide greater biodefense coordination and capabilities across agencies (Tucker, 2004). The directive emphasized four pillars of biodefense: threat awareness, prevention and protection, surveillance and detection, and response and recovery (Bush, 2004). Although threat assessment projects, including Project Clear Vision, Project Jefferson, and Project Bacchus, had already been in place, the directive further emphasized the importance of such studies to improve understanding of current and future threats. Under the directive, DHS was required to produce risk assessment reports to outline the potential concerns posed by biological threats, as well as the country's biodefense response ability and vulnerabilities (Bush, 2004). To implement this provision, DHS created the National Biological Analysis and Countermeasures Center (NBACC).

The NBACC is composed of two centers: the National Biological Threat Characterization Center (NBTCC) and the National Bioforensic Analysis Center (NBFAC) (NBTCC, 2018). While each center plays a unique role in understanding, preparing for, and detecting biological threats, it is the NBTCC that has driven concerns around BWC Treaty compliance. This paper is

concerned with the permissibility of threat characterization, and therefore will focus primarily on the NBTCC.

Scientists at the NBTCC conduct studies and laboratory experiments to better understand information gaps and prepare for biological threats. The Center characterizes potential threats through “investigating potential biothreat pathogens, studying pathogen stability and viability, and assessing lethality through dose/response studies” (Shea, 2006). In a presentation by Lieutenant Colonel George W. Korch, Jr., Ph.D., United States Army, the Deputy Director of the NBACC, during the inception of the program back in 2004, discussed certain laboratory efforts including genetic engineering, host range studies, and aerosol dynamics (Korch, 2004). Through these scenarios, law enforcement, public health officials, and policy makers can gain a better understanding of information gaps and vulnerabilities, develop countermeasures, and better inform the stocking of the national strategic stockpile (Gerstein, 2017).

After the aforementioned presentation by Lieutenant Colonel Korch, security experts brought forth strong concerns surrounding the activities and intentions of NBTCC. In their paper, *Biodefense Crossing the Line*, Milton Leitenberg (Senior Research Scholar at the Center for International and Security Studies at Maryland School of Public Policy), Ambassador James Leonard (Head of the United States Delegation to the Biological Weapons Convention Negotiations, 1972) and Dr. Richard Spertzel (Former Deputy Director, USAMRIID, and Senior Biologist on the Staff of the United Nations Special Commission (UNSCOM), 1994-1998) jointly expressed concerns around the NBTCC and treaty compliance (2004). Activities outlined in Lieutenant Colonel Korch’s presentation including “computational modeling of feasibility, methods, and scale of production” and plans to “store, stabilize, package, disperse....may constitute development in the guise of threat assessment, and they certainly will be interpreted

that way,” they feared (Leitenberg, Leonard, & Spertzel, 2004). The difference between the former offensive US Biological Weapons program pre-1969 and the newly formed NBTCC appeared to be little more than the former’s production and stockpiling of biological weapons; the latter would solely develop all the necessary skills, materials, and technologies, stopping just short of production (Leitenberg et al., 2004). At its outset, a program that essentially created biological weapons as a means to understand potential threats and develop appropriate counter measures, tested the boundaries of the BWC Treaty.

## **The proposed closing of the NBACC**

After over a decade of operation, the FY 2018 DHS budget revealed significant cuts in funding for certain laboratories, one of which was the NBACC (FY 2018 Budget). In May 2017, DHS notified the NBACC of the plans to shut down the Center; research at the center would be halted by March 2018 and the facility would officially close its doors by the September of that same year (Gaines, 2017). Maryland lawmakers have pointed to the pressure on DHS to fund the Trump Administration’s border wall and increase in border security as contributing factors to the shift in funds (Gaines and Masters, 2017; McLaughlin, 2018).

In an effort to prevent the NBACC’s closure, Representative John Delaney (D-MD) and Representative Dan Donovan (R-NY) included an amendment in the National Defense Authorization Act (NDAA), which annually authorizes funding and policies in defense-related areas (Gaines and Masters, 2017). The amendment includes a provision to ensure proper protocol is followed prior to enforcing the closure of the facility. According to the amendment, DHS and DOD are required to file a joint report assessing potential effects of closing a BSL4 lab (such as the NBACC) on biodefense and address factors including the cost, mission impact, and transition

plan (Martin, 2017). Additionally, prior to closure, the heads of the two agencies are required to consult with others including the FBI, Attorney General, Director of National Intelligence and others within DHS (Martin, 2017). Furthermore, officials are restricted from utilizing NDAA Funds to close the NBACC prior to submitting the report to Congress (Martin, 2017). The amendment included in the final version of HR3354 passed 344 to 81 with votes from 116 Democrats and 227 Republicans (Gaines, 2017).

Members of Congress and national security experts raised concerns about the potential consequences of closing the NBACC. In an interview with Homeland Preparedness News, United States Senator Ben Cardin (D-MD) said, “The need to protect the American people from biological threats is very real and should not be brought to a screeching halt for arbitrary reasons. Moves to close the NBACC are ill-advised and this congressionally mandated study should provide the thoughtful analysis needed to upend such plans that would run counter to our national security” (Martin, 2017).

The amendment in the NDAA was proposed to allow time for government officials to consider whether the NBACC, and therefore the NBTCC, should continue in the future. On March 23, 2018, the Federal Omnibus Spending Bill restored funding to the NBACC as well as the Chemical Threat Analysis Center (CSAC) and National Urban Security Technology Laboratory (NUSTL) (DHS, 2018). While experts have attributed the proposed cuts to poor decision-making and a “budgetary assault on science” (Schlegelmilch, 2017), it provided an important opportunity to reconsider a program that many fundamentally opposed at its inception.

## **Interpretation of the Treaty**

Article 1 of the Biological Weapons Convention (BWC) Treaty states:

Each State Party to this Convention undertakes never in any circumstances to develop, produce, stockpile or otherwise acquire or retain:

1. Microbial or other biological agents, or toxins whatever their origin or method of production, of types and in quantities that have no justification for prophylactic, protective or other peaceful purposes;
2. Weapons, equipment or means of delivery designed to use such agents or toxins for hostile purposes or in armed conflict.

Supporters of the NBTCC largely base their justification for the program on their interpretation of the first part of Article 1. Use of microbial or other biological agents are not necessarily forbidden unless they do not have “prophylactic, protective, or other peaceful purposes” (Ruppe, 2004). As such, it is argued that microbial or other biological agents or toxins for protective purposes are justified. Under this read, the intent of the program is argued to be of greatest importance for justification.

Government officials who support threat assessment insist that under the BWC Treaty, biological agents created for nefarious use are forbidden, while those created for protective purposes are justified. Maureen McCarthy, the former Director of Research and Development at the DHS stated, “The treaty is intent-based. Our intent and the intent of all the biodefense programs going on in the nation right now is to develop protective measures to protect the American public” (Ruppe, 2004). Since a defensive and offensive program would look identical, former United States Under Secretary of State for Arms Control and International Security, John

Bolton, in a 2002 speech stated that the intent of the program, as opposed to the equipment, should be used as the metric to judge treaty compliance (Ruppe, 2004). Military and CIA lawyers have also supported the claim that the treaty is intent-based, arguing that the United States is therefore in compliance with it (Ruppe, 2004).

Interpretations of the treaty such as McCarthy's and Bolton's have been subject to debate. Although many security experts have agreed that the first part of Article 1 allows for creation or collection of biological agents for protective purposes, it does not necessarily allow for this in the second part of Article 1; weapons, equipment, and means of delivery may be forbidden regardless of offensive or defensive intent. Security experts cite the writing of the treaty was specifically intended as a means to prevent an offensive biological weapons program to thrive under the guise of a defensive program (Tucker, 2004). Lois R. Ember writes that in an effort to assess and prevent future attacks, the NBTTC "may cross the line from treaty-permissible defensive research to treaty-barring offensive research" (Ember, 2005)

The debate behind the interpretation of the BWC Treaty largely rests on the meaning of the wording in the Treaty. While the interpretation of first part of Article 1 is largely uncontroversial, proponents of the program believe that the entirety of the Treaty allows for threat characterization. One area of scrutiny may be the word *designed* under the second part of Article 1; did the writers of the Treaty intend for a literal interpretation of the word? Opponents of threat characterization may argue that the word *designed* was purposefully used. The wording could quite literally mean weapons, equipment, or means of delivery that have design characteristics that make them capable of being used for hostile purposes or in armed conflict, regardless of intent. If the authors meant the word "designed" to be interpreted as "intended," one can wonder why they would not have simply used this word instead. If the BWC Treaty is to

mean ‘created with hostile purposes in mind’, then an activity such as creating a bomblet and releasing a simulant pathogen may very well cross BWC Treaty boundaries. In contrast, if ‘designed’ is interpreted as ‘intended’, such as weapons, equipment, or means of delivery with the *intention* to use for hostile purposes, then a program created to characterize threats, and not act upon them, may be within BWC Treaty guidelines. Further, the words “in hostile purposes” as contrasted with “in armed conflict” by use of the word “or” in the second section of Article 1 may signal that while the former may imply offensive intent, the latter is meant to be broadly construed.

While it is difficult to unearth the “true” meaning of the BWC Treaty, the Treaty nevertheless does not have strong enforcement provisions for when state-parties are non-compliant. The treaty includes a verification process that requires state-parties to work together to resolve issues of compliance and outlines procedural mechanisms for state-parties to issue a complaint with the UN Security Council if another member is believed to be out of compliance with the agreement (Kimball, 2018). While the UN Security Council has the power to investigate such complaints, this regulatory mechanism has yet to be invoked.

Since the signing of the BWC Treaty, many state-parties have either violated or been accused of violating the treaty. The largest violation was the Soviet Union’s creation of Biopreparat a year after signing the treaty (Kimball, 2018). Within this program, the Soviet Union conducted an offensive program under the guise of a vaccine development facility for civilians. Additionally, after the Persian Gulf War, the UN Special Commission discovered that Iraq, a BWC Treaty state-party, had been developing an offensive biological weapons program (Kimball, 2018). Other countries including Libya, North Korea, Syria and Cuba have all raised



compliance concerns. As mentioned above, concerns have been raised about the United States' activities as well over the years (Kimball, 2018).

Whether or not activities conducted under threat characterization are in violation of the BWC Treaty, a legal justification does not signify a moral one. In the remainder of this paper, I will explore whether the United States' interpretation of intent within the treaty affords a reasonable moral defense; in essence, is the country morally justified in the continuation of threat characterization programs?

## **The moral justification**

There are various moral frameworks, in addition to a legal framework, utilized to judge the permissibility of an action. In consequentialism, the deontic status of an action is characterized by the intrinsic value of the resulting outcome or consequence of the action. While there are different forms of consequentialism, there are two common characteristics that all theories of consequentialism hold. First, the value of the action is not based in the intrinsic value of the action itself. Unlike other moral theories to be discussed below, consequentialism is not concerned with the "right action." Second, the determination of the rightness or wrongness of an action is related to the consequences of the action. The action that maximizes the good, or at least minimizes the bad, is the morally right option. If consequentialism were to be used to justify threat assessment programs, the permissibility of the program would be based upon the action that leads to the greatest good (or least harms). While proponents of threat assessment take the outcomes of the program into account, the justification for the program does not solely rest upon consequences; supporters of threat assessment assume intent matters. Therefore, consequentialism is not the correct moral framework to be used here.

In contrast to consequentialism, in deontological theories such as Kantianism, the consequences of one's action do not determine the permissibility of the action; rather, it is determined by the intrinsic value of the action itself. Similar to consequentialism, in deontological theories, the permissibility of an action rests upon more than intent. The theories consider certain principles that an agent should follow, regardless of their intention, to act in accordance with her duty. While intention is still important to the moral worth of an action, it is not sufficient to determine permissibility of an action. Therefore, a deontological moral framework differs from the justification utilized for threat assessment. The justification for threat assessment emphasizes that the intent is the essential component in determining whether the program is morally justified.

There is one principle common to moral reasoning that gives intent a central role in determining the permissibility of an action: the doctrine of double effect (DDE). The doctrine of double effect holds that an act may be permissible, even if there are foreseeable negative consequences, as long as the actor is aiming for the good outcome. This moral justification is often utilized in medicine. A doctor attending to a patient near the end of her life may continue to alleviate the patient's suffering with morphine. While the morphine can assist in alleviating pain, it can also hasten death. Intentionally killing a patient is never permitted, but the doctor's actions are considered to be morally permissible because the doctor is aiming to minimize the patient's pain; death is solely a foreseeable consequence.

This moral framework is also used in just war theory. It is permissible to pursue a greater good, even if there are foreseeable negative consequences, so long as the actor is aiming for the greater good. In war, bombing a munitions factory as a means to end the war is pursued to achieve a greater good, but there may be foreseeable civilian casualties, including children, as a

result of this bombing. In war, it is not permissible to target innocent civilians. The DDE adjudicates this problem; as long as the intent of the bombing is to destroy the munitions factory and not to kill the innocent civilians, the action is morally justifiable (Dorbolo, 2001).

While proponents of threat assessment do not explicitly invoke the doctrine of double effect to justify threat assessment, this doctrine offers the best moral defense of the program. Implicit utilization of the DDE is common in both everyday cases as well as in war, so perhaps proponents of threat assessment are implicitly using this rationale. Threat assessment programs are considered to be morally permissible as long as the action is aiming for a certain consequence: defense. If the program is aiming for offense, it is not justified.

The justification within the DDE is dependent upon proportionality; the foreseeable benefit must be greater than the foreseeable consequences. The military may not hit the munitions factory if little benefit is expected, knowing that innocent civilians will also suffer. Proportionality between the benefits and burdens is necessary to justify the foreseeable consequences.

Through this line of reasoning, proponents of threat characterization should consider proportionality. While intent is the key part of the doctrine of double effect, utilization of intent to justify an action can only proceed so long as the potential benefits are proportional to the foreseeable consequences. There are many benefits derived from threat characterization including a better understanding of information gaps, increased knowledge of our vulnerabilities, and countermeasure preparation. In the event of a mass biological attack, knowledge and technologies gained through threat assessment would have the potential to save hundreds of thousands of lives. But the potential consequences of threat assessment include 1) the appearance of a treaty violation, 2) a biological security dilemma, and 3) the risk of leaks in information,

technologies, and novel pathogens. These risks must be factored in if the proponents of threat assessment are to justify the program through their own moral framework.

### *Considering the consequences*

Regarding the first of these potential consequences, even if threat assessment activities are not in violation of the BWC Treaty, countries may still believe that the activities conducted are not permissible under the Treaty. Lois R. Ember writes that security experts “maintain that even the perception of violation is sufficient to weaken this bulwark against the use of biological weapons agents and diminish, not enhance, national security” (Ember, 2005). While the treaty does not have strong enforcement provisions, its enactment in 1972 created a norm around the deterrence of biological weapons and most likely made more states hesitant to engage in such activities (Enemark, 2016). If the United States uses a loose interpretation of the treaty to justify its program, other countries may be encouraged to follow suit. Former United States Ambassador to the UN, James Leonard, who led the United States negotiations of the BWC Treaty said that the interpretation of the treaty could have grave consequences because other states may “see this as dangerous to their country to have anybody, especially the trend-setter, the leader, the model, the United States, doing something that is so clearly over the edge of what the treaty permits” (Ruppe, 2004).

A second potential consequence of a threat assessment program is a biological security dilemma. In his book, Political Realism and Political Idealism, John Herz describes the paradox of a security dilemma: one state’s efforts to increase security through enhancing its own capabilities appears threatening to other countries, and so in turn, the other states enhance their

capabilities (1951). When this occurs, it leaves each state less secure than it was prior to engaging in such activities.

When this theory is applied to a state's biological defense program, various biological experts including Johnathan Tucker feared it could turn into a "biological security dilemma" (Tucker, 2006). Even if the program is designed to enhance defensive capabilities, outside countries may still perceive the intent of such activities as offensive. The dual use nature of various activities can help a country understand how to better respond to threats while simultaneously learning how to create such threats. Activities such as creating genetically modified pathogens can occur in both offensive and defensive programs. Mark Wheelis, a professor of microbiology at the University of California-Davis when discussing NBTCC said, "This is absolutely without any question what one would do to develop an offensive biological weapons capability" (Ruppe, 2004).

As noted above, this mutual distrust between states and their biological weapons programs date back to the Cold War (Enemark, 2016). Following the signing of the treaty, the world superpowers could not settle on a system to ensure treaty compliance. This mutual suspicion has continued on and security experts say that government officials instituting the NBTCC are "working from a cold war model" and may invoke a "renewed biological arms race."

When there is little transparency, outside states have little more to rely on than their own intelligence capabilities and the United States' word. Tucker wrote that the United States has a blind spot regarding how potential adversaries including China, North Korea, and Russia perceive threat assessment programs (2006). A 2017 United States intelligence report described countries with little transparency and unknown intentions to pose a potential security threat. If

the United States questions other countries' intentions, other countries have reason to question the United States' intentions as well. Furthermore, the United States history of biological weapons defense programs and lack of transparency does little to bolster the country's integrity. Secret programs including Project Clear Vision, Project Jefferson, and Project Bacchus that were not declared in the annual BWC Treaty's Confidence Building Measures undermined the United States integrity and raised questions about the United States' BWC Treaty compliance (Tucker, 2004).

Finally, threat assessment activities could also lead to a greater risk in the leakage of information, technologies, and novel pathogens. While security measures are in place to protect from outside threats, the risk of leaks from the inside remains (Tucker, 2006). The 2008 report from the Commission on the Prevention of Weapons of Mass Destruction states the United States should be less concerned that terrorists will become biologists and more concerned about its own biologists, working in laboratories, becoming terrorists (Graham et al, 2008). For instance, both Aldridge Ames from the CIA and Robert Hansen from the FBI successfully passed polygraph tests and other exams while selling classified information to the Soviet Union (Tucker, 2006). Decades passed before they were caught and arrested for leaking information (Tucker, 2006). The 2001 anthrax mailings in the United States (although still debated) were attributed to Bruce Ivins, a scientist working within a United States laboratory. Whether or not Bruce Ivins was the true perpetrator of the attack, or solely a scapegoat, the event showed that even those working in secure facilities with a high security clearance, could be responsible for bioterrorism (Enemark, 2016).

While certain efforts to address threats have been implemented, there are unique challenges to enhancing biosafety and biosecurity. Security measures used for chemical or

nuclear work cannot be applied to biological work. While fissile nuclear substances such as plutonium can be tracked and accounted for, pathogenic microorganisms are invisible and self-replicating (Enemark, 2016). If an individual from the inside wants to smuggle a pathogen culture out of the lab, it would be fairly easy to conceal, and the risks of getting caught would be low (Tucker, 2006). Second, even regulated pathogens, referred to as “select agents” that are highly controlled and difficult to access, including Ebola, anthrax, and hendra virus, do not need to be removed from the lab to pose a threat. Many of these agents can be found in nature. Third, with advances in synthetic biology, agents less accessible in nature, such as smallpox, can be synthesized. Threat characterization programs may further advance the know-how of how to create a dangerous agent and subsequently use for nefarious purposes.

### *Potential benefits*

With the dual use nature of life sciences, it is difficult to distinguish other countries intentions. In the past, gathering intelligence in biosecurity to assess threats and prepare countermeasures has led to minimal benefits (Petro & Carus, 2005). In their analysis of the NBTCC, Ben Petro and Seth Carus write that biological weapons analysts are often reliant on information that is dated, incomplete, contradictory, and lacking sufficient detail (2005). With uncertain and uninformative reports from analysts, there is little guidance to improve and prepare vital security measures.

As an alternative to traditional intelligence gathering mechanisms, threat characterization activities provide an important tool to enhance national security efforts by 1) improving understanding of information gaps, 2) providing technical knowledge of the United States’ vulnerabilities, and 3) informing countermeasures preparation. With emerging technologies and the rapid advancements of genetic engineering, adversaries may have the ability to create an

attack that renders current countermeasures ineffective (Petro & Carus, 2005). By staying ahead of the threat and preparing for various attacks through threat characterization, the country can be equipped in the event of a biological weapons attack. Further, the National Threat Characterization Center allows for the development of this data in a secure venue with high levels of biosafety and state of the art security features (Petro & Carus, 2005).

While threat characterization may provide a useful tool to enhance national security measures, major gaps in the ability to defend against a biological attack remain. UN Secretary General Ban Ki-Moon stated that countries should be considering the growing risks of an attack coupled with “glaring gaps in our ability to both prevent and respond to this nightmare scenario” (Guthrie, 2016). In the United States, the ability to respond to an attack greatly varies from state to state. In the Trust for America’s Health report, the organization found that 26 states as well as Washington, DC, scored six out of 10 or lower on preparedness indicators (Gerstein, 2017). Further, natural outbreaks of Ebola and Zika have demonstrated countries’ - including the United States - slow response mechanisms, naiveté in infection control procedures, and the inadequacies of the global health capacity to respond to such threats.

These poor responses, coupled with the United States’ lack of a comprehensive biodefense strategy, further increases the potential impact a biological attack could have on the country. Since the anthrax attacks occurred more than 15 years ago, responsibility for biodefense is still spread across different agencies with poor coordination mechanisms in place. While the NDAA for fiscal year 2017 calls for greater collaboration across agencies including DOD, DHS, USDA, and HHS to develop and implement a national strategy, a collaborative cross-agency approach has yet to be instituted.



While one can simply assess the risks and benefits of the NTBCC, these do not exist within a vacuum. The proposed closure of the NBACC raised additional potential concerns that cannot be ignored. In a letter to the President, Maryland lawmakers described the decision to close the laboratories as alarming and one that would put the American people at risk by opening the door for nefarious actors to exploit vulnerabilities (Cardin, Van Hollen, Ruppersberger, & Delaney, 2017). Further, the proposed budget removed funding for the laboratories without considering any continuity strategy for the work. Even if replaced, the NBACC is unlike any other currently in the United States. With 51,927 square feet of lab space, and BSL-2, BSL-3, and BSL-4 capabilities, the laboratory was designed with state-of-the art features and capabilities that many agencies within the government rely on. In the laboratories, scientists work with some of the most dangerous pathogens, some of which do not have treatment or vaccines available. Daniel Gerstein, who was the acting Under Secretary and Deputy Undersecretary in the Science and Technology Directorate of the DHS from 2011-2014 referred to the NBACC as an insurance policy. “It is maintained at significant cost, and like most insurance policies, these costs may not be universally perceived as good investments until, God forbid, they might be needed in a crisis,” writes Gerstein. If an attack were to occur, the NBACC would be the first responders in mitigating catastrophic consequences and providing information to decision makers.

The potential closure of the NBACC, and therefore the NBTCC, comes at a time when the risks of biological weapons are on the rise. The growing accessibility and advancements of biotechnology are rapidly eroding the barriers to pursuing biological weapons. Richard Danzig, a former United States Navy Secretary who interviewed members of Aum Shinrikyo, said the advancements in biotechnology would now allow for a biological weapons factory to operate in a smaller and more covert manner (McLaughlin, 2018). Terrorist groups including Al Qaeda and

ISIS have called for like-minded scientists to pursue biological weapons use (Gerstein, 2017). At a time when the risk of a biological attack is on the rise, the decision to weaken the United States' defenses could have disastrous consequences (Cardin et al., 2017). Daniel Gerstein writes, "The degree to which the United States will be prepared to respond could be directly related to the preparations made now at NBACC" (2017).

### **The paradox of the program**

While there are a host of negative consequences that could arise from the program, we may have become buried so far in our reliance on the program that the effects of closure may pose an even greater threat, leaving the United States in quite the conundrum: do we maintain a program with foreseeable negative consequences or do we close the program, potentially allowing for the exploitation of greater vulnerabilities. Either option impacts the mutual goal of national security. There may be no perfect solution for the future of the NBTCC, but ultimately, as we move forward and evaluate the merits of threat characterization in future funding decisions, we must ensure the benefits are proportional to the foreseeable consequences.

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**Biography:**

Claire Elise Mena was born in San Jose, California in 1994. She attended the University of New Mexico and obtained a Bachelors of Arts in Political Science and a Bachelors of Arts in Journalism. Following graduation, Claire began working at Genetic Alliance. Claire enrolled in the Masters of Bioethics program at Johns Hopkins University in 2017. During her time in the program, she worked as a research assistant at the Johns Hopkins Center for Health Security.